tantisms, amusements, hobbies,—we try them all through to the end only to cry out at last that all is vanity. No one is horrified at this false, this blasphemous saying; indeed it is thought to be wise and irrefutable. But there are a few persons who, anticipating such intolerable feelings, in order to avoid all partial resignations, resign themselves universally once for all. Such persons convince themselves with regard to the eternal, necessary, law-governed order of things, and seek to acquire ideas which are indestructible and are only confirmed by the contemplation of that which is transient."[3]

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PROBLEMS OF PURE FORM.

AN EDITORIAL DISCUSSION WITH M. LUCIEN ARRÉAT AND G. A. BLACK.

The Editor has received two comments on his exposition of the nature of mathematics. One comes from M. Lucien Arréat, who objects to the idea that the triangle is a product of three lines on the ground that it consists of a section of the plane bordered by three lines.

We translate from M. Arréat's letter: "Is it quite correct to consider *lines* as *elements* which produce the triangle? By construction the lines bound a portion of space, but they do not produce this portion; they only define the figure conceived or indicate directions. Lines do not seem to me to be real in any different sense than the figure which they render visible to our eyes. They do not seem to me to be a quantity while the figure which they ideally define would be a quality. These remarks do not however in the least prevent us from studying the triangle as a type of form."

Lines have qualities such as direction. The line consists of length without breadth or thickness, and lines can be measured quantitatively according to their length. When three or more lines intersect they produce geometrical figures, and these geometrical figures possess new qualities not to be derived from their elements which in this case are mathematical lines.

What M. Arréat calls the triangle is really the contents of the triangle, viz., its area enclosed by the sides. The character of the triangle consists of the direction and the length of its three sides

[3] *Dichtung und Wahrheit,* Bk. XVI.

with all the relations they imply. The triangle cuts out of the plane an area of a definite shape, and it possesses a great number of qualities determined by the interrelation of the sides, such as definite angles and perpendiculars, and it has a definite inscribed and a circumscribed circle, besides ascribed circles, etc., the sides extending beyond the three corners into infinity.

The other comment is offered by Mr. George Ashton Black who writes as follows:

"A passage on page 9 of your pamphlet entitled *The Philosophy of Form* moves me to send you the following remark:

"The assemblage of cognitions properly named and ordered by you

plane
straight line —
parallel lines =

is necessary and sufficient to construct mathematically Kant's metaphysical theory of cognition generally, meaning his enumeration of the different successive steps in the process of making any object by degrees completely known according to a constant rule. Witness

$$\text{ideal} \begin{cases} \text{intuition} & \text{synthesis} \\ \text{concept} & - \text{analysis} \\ \text{idea} & = \text{dialectic} \end{cases} \text{method}$$

where the same cognitions, considered from two different points of view, are regarded on the one hand as determinations of a known object; on the other as acts of a knowing subject.

"Accordingly the classic symbol of equivalence (=) as a fact or thing done is the norm or prototype not merely of mathematical science, but even of any science whatever; and the actual production of it by degrees is the simplest possible real use and practical application of the scientific method complete."

Mr. Black's proposition that the plane, the straight line and parallel lines are all the essentials needed for constructing the metaphysical aspects of the Kantian world-conception will scarcely be contradicted if we agree on the term metaphysical. It is interesting to see that in other realms of purely formal thought, especially in logic, the Euclidean character of space is assumed to hold good, and is more closely connected with the foundation of logic than may appear at first sight. Note that the logical figures are all in the shape of mathematical constructions in a plane. The figures of logical reasoning which serve as arguments are circles or squares illus-

trating the relations of genera and species, the former enclosing the latter and explaining in a visible shape their interrelations and the deductions made therefrom. All these arguments presuppose that lines can be made to return to themselves; they are based on the condition that lines may lie in one and the same plane and may constitute figures bound up in definite limits. They presuppose a space not necessarily Euclidean but of a continuity which does not permit the contents to skip out into a third dimension. It is true that the logical diagrams are mere illustrations, not proofs, but if illustrations do not hold good, we have no ground for classifying objects or making any generalization. The idea of form is at the bottom of all thinking, and the assumption of the possibility of a sameness of forms alone justifies us in speaking of "*All A*" and drawing the conclusion that if all A's are B then every single A is B. P. C.

CURRENT PERIODICALS.

In *Mind* for April, S. Alexander continues his paper on "Collective Willing and Truth." J. S. Mackenzie, in a paper entitled "A Sketch of a Philosophy of Order," advocates, "in a brief and somewhat tentative fashion, a point of view that has at least proved helpful to myself in the effort to understand these apparently simple but in reality most difficult problems"—the nature of truth and error and of relations. "It has been my endeavor," he says in conclusion, "to exhibit certain fundamental conceptions as being involved even in the simplest facts of experience; and to show that reflection on them leads us gradually to the recognition of a certain ideal order, which is at least the foundation of our moral aspirations, and may perhaps serve as a basis for an idealistic or spiritual interpretation of the universe. My contention is that there is nothing even in sense which does not already imply something of the nature of an ordered universe. Such an idealism does not seem to be in any way opposed to what is commonly called realism; and it seems to me that we may find in this method of treatment a possible conciliation between views that are usually regarded as antagonistic." The Rev. Oliver Quick has an article on "Bergson's *Creative Evolution* and the Individual." Howard V. Knox writes an appreciation of "William James and his Philosophy," and concludes: "After all, James might well be content to rest his title to fame on his having translated the question 'What makes knowledge possible?' into